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### (54) Attachment device for a mobile station.

(55) The invention relates to an device (1, 2, 3) to be used with a mobile station, comprising a body (1) to be attached e.g. to a belt with an attachment plate (5) and a fastener (2) attached to a mobile station with a fitting piece (3); said body (1) including control flanges (8) bent inward from two opposite sides and from below to guide the fastener (2) which comprises a neck (10) and a wider end consisting of a flange (9) placed behind the guide flanges (8); the body (1) includes a projection (7) or a similar structure acting against a spring force, resisting the upward movement of the fastener (2) when said fastener (2) is in the locked position.

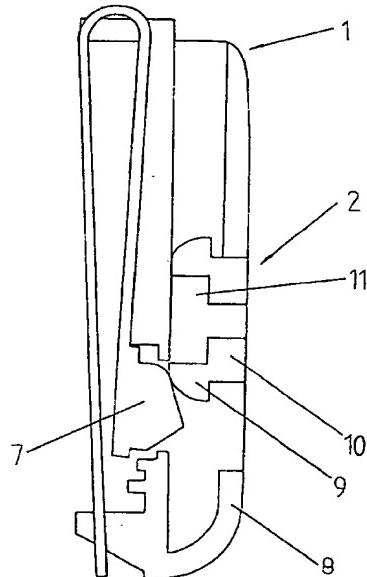


FIG. 4

The invention relates to a device for removably attaching a mobile station such as a mobile telephone or a paging device to a belt or other garment.

As the number of mobile stations increases people need more often to carry these devices, like mobile telephones or paging devices, with them. Carrying a mobile telephone, for example, in one's hand is inconvenient and as the mobile telephone is unattached it is easy to forget to take it along. Carried in a pocket, a mobile station might get bumped or it might fall and get broken. To solve these problems, there have been developed various racks or holders attached to a belt into which a mobile station, particularly a mobile telephone, can be attached when not in use but instead carried along. The disadvantage of these racks or holders is their rigid and complex structure and the size of the attachment on the telephone. These racks or holders often attach the telephone vertically to the belt making it impossible to rotate the telephone forwards or backwards around the point of attachment, e.g. when sitting down, and as such the telephone may cause a feeling of pressure on the user's waist.

According to the present invention there is provided a device for removably attaching a portable telephone to a garment, comprising; a first part adapted to be attached to a portable telephone; and a second part adapted to be attached to a garment, wherein the second part further comprises means for slidably receiving and locking the first part such that in the locked condition, relative rotation between the first and second parts is permitted.

An advantage of the invention is that it provides a device that can secure a mobile station to a user's belt or other garment whilst allowing rotation of the mobile station about the point of attachment when required, for example, when sitting down.

Advantages of the embodiments of the invention are that they provide a device with a simple structure and operation, which are easy to install onto and remove from a mobile station, and are simple and inexpensive to manufacture.

For reasons of simplicity, the device in accordance with the invention is described below in association with a mobile telephone attached to a user's belt. A device in accordance with the invention can also be used in connection with other mobile stations, such as pagers, and it can also be attached to garments other than belts.

A device in accordance with the invention comprises two parts: a body of the device which remains on the belt when the telephone is used; and a fastener attached to the telephone with a clip. The telephone can be locked onto the belt and unlocked from it with the help of a locking wedge. While on the belt, the telephone can be rotated, when necessary, around the axis of the fastener and the user can, for example when sitting down, easily rotate the telephone for-

ward or backward around the axis of the fastener so that the telephone will not cause a feeling of pressure on the user's waist. The telephone is easily removed from the belt by holding the body of the device while at the same time lifting the telephone connected to the fastener. The device in accordance with the invention enables easy removal of the telephone from the belt without breaking or scratching the belt or the telephone. When attaching the telephone to the belt the user has to only push the telephone down towards the body of the device and the telephone will be locked to the body with the help of an inward-bent flanged edge on the body and a locking protrusion operating in a biased manner.

Embodiments of the invention will now be described, by way of example, with reference to the accompanying drawings, in which:

Figure 1 is a side view of a device in accordance with the invention and a telephone;  
 Figure 2 is a front view of the body of the device in Figure 1 attached to a belt;  
 Figure 3 is the fastener and clip part of the attachment device;  
 Figure 4 is a sectional drawing of the body of the attachment device with the fastener being attached to the body, and  
 Figure 5 is a sectional drawing of the body of the attachment device with the fastener locked to the body.  
 In Figure 1, there is shown a portable telephone 4 and a device comprising a body 1, a fastener 2, and a clip 3. There is connected to the body 1 a U-shaped plate 5 enabling the body to be attached to a belt. The U-shaped plate 5 comprises a sheet-like part bent in a U-shape and is connected from a point on the bend to the upper portion of the body 1 so that the U-shaped plate 5 is parallel to a flat surface 12 of the body. The U-shaped plate 5 is elastic at the U-bend and can be placed over a belt so that the body 1 remains on the outside of the belt as illustrated in Figure 2. The lower portion of the branch of the U-shaped plate 5 placed behind the belt can be free or there may be a locking system in it to attach the lower part of the U-shaped plate 5 to the lower part of the body to prevent the body from being pushed up and/or falling out whilst on the belt. The branch of the U-shaped plate 5 placed in front of the belt provides a spring with which a locking protrusion 7 acts.

In Figure 2, the body 1 is attached with the U-shaped plate 5 (not shown) to a belt 6. The body 1 has a flat surface 12, a rounded lower end and a locking protrusion 7 for locating the fastener 2 shown in figure 1 and for locking it within the body 1. The body 1 also includes a guide flange 8 creating a channel which guides the fastener 2 to the correct position over the locking protrusion 7. In this position a flange 9 of the fastener 2 (Figure 3) locates under the guide flange 8, between the guide flange 8 and the flat surface 12

of the body 1. The distance of the gap between the guide flange 8 and the flat surface 12 of the body corresponds substantially to the thickness of the flange 9 of the fastener 2.

Figures 1 and 3 show a clip 3 with which the fastener 2 is attached to the portable telephone 4. The clip 3 is suitable for installing onto the telephone casing transversely with respect to the longitudinal axis of the telephone. The clip 3 comprises a plate bent around the edges of the telephone casing and extending along the sides of the casing such that it corresponds to the shape of the telephone. Furthermore, the ends of the clip 3 are bent in such a manner that they grip a groove-like seam at the join of the front and back covers of the telephone casing or a groove formed in another place on the telephone housing. The bent ends of the clip act as springs which grasp the telephone casing, holding the clip tightly in position.

The clip may also be any other known means for attaching the fastener to a telephone casing.

The fastener 2 is attached to the clip 3 so that it is centrally disposed across the width of the telephone casing. The fastener 2 comprises a neck 10, a flange 9, and recess 11 all of which are radially symmetric and are aligned along a common axis. The length of the neck 10 is slightly greater than the thickness of the guide flange 8 which circles the flat surface 12 of the body. The length may, for example, be about 3 to 10 mm.

Figure 4 illustrates the operating principle of the device in accordance with the invention. The figure shows the body 1 with the locking protrusion 7 and the fastener 2. The clip attached to a telephone is not shown. In the body 1, near its lower end, there is an aperture into which the locking protrusion 7 is positioned. The fastener 2 pushes the locking protrusion 7 back against the spring force of the U-shaped plate 5 when the telephone is removed or inserted. In Figure 4, the fastener 2, normally attached to a telephone, is being inserted into the body 1 of the device. A guide flange 8 consisting of an edge bent inward circles the sides and the rounded lower part of the body 1. The space between the guide flange 8 and the flat surface 12 of the body is wide enough to house the flange 9 of the fastener 2. The function of the guide flange 8 is to guide the fastener 2 over the locking protrusion 7 and to hold it so that the flange 9 of the fastener 2 stays within space between the flat surface 12 of the body 1 and the guide flange 8.

In Figure 4, a telephone with the fastener 2 is being pushed downwards into the body 1. The edges of the locking protrusion 7 in contact with the flange 9 of the fastener 2 are rounded and angled so that the flange 9 of the fastener 2 pushes the locking protrusion 7 back against the spring force enabling the fastener 2 to slide over it. There is in the fastener 2 a recess 11 with a substantially circular cross section

the diameter of which substantially corresponds to the diameter of the locking protrusion 7 in the longitudinal direction of the body 1 so that the locking protrusion 7 fits into the recess 11 when in the locked position of the device.

The process by which the body 1 receives the fastener 2 and subsequently locks it in place is illustrated in Figures 4 and 5 and is described as follows. The fastener firstly enters the channel formed by the guide flange 8 through an opening located at the top of the body 1. The fastener 2 then slides downwards in the channel until the flange 9 of the fastener 2 contacts the locking protrusion 7 as shown in Figure 4. Further urged sliding of the fastener 2 forces the locking protrusion 7 against a biasing action, in a direction away from the fastener 2 and thus clearing the channel to allow the fastener 2 to proceed to the position shown in Figure 5. In this position the fastener 2 is snap locked in respect of sliding movement up or down the channel. The channel also prevents displacement along other perpendicular axis. Rotation of the fastener 2 with respect to the body 1 is, however, permitted. Subsequent removal of the fastener from the body is achieved by urged sliding of the fastener upwards towards the opening of the channel. The action of the inner, recess surface of the flange 9 against the angled surface of the locking protrusion 7 forces the locking protrusion 7 in a direction away from the fastener 2, thus clearing the channel. Once past the locking protrusion 7 the fastener 2 is then allowed to freely slide upwards along the channel and eventually out through the opening at the top of the body 1.

Figure 5 shows the fastener 2, normally attached to a telephone, installed in the locked position within the body 1. The locking protrusion 7 is located in the recess 11 of the fastener 2. The flange 9 of the fastener 2 is between the flat surface 12 of the body 1 and the guide flange 8.

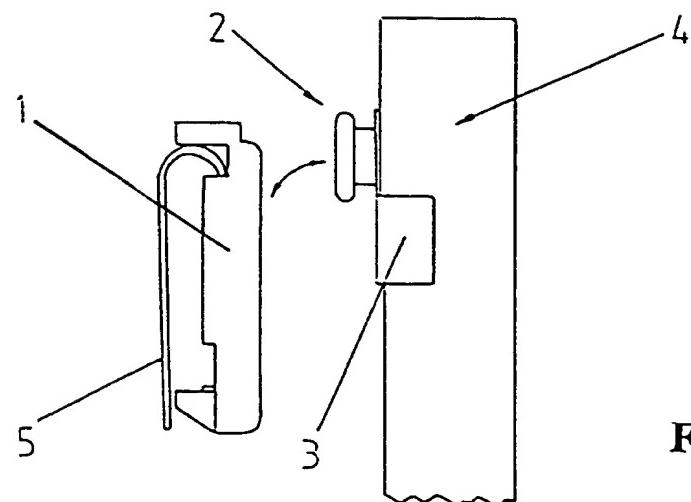
The telephone can be easily and quickly removed from the belt by holding the body of the device and at the same time lifting the telephone upwards. In this situation the locking protrusion 7 is pushed back, due to it having an angled edge, against the spring force of the U-shaped plate 5 enabling the fastener 2 to slide over it.

The neck 10 with a circular outer perimeter and the flange 9 and the guide flange 8 circling the edge of the flat surface of the body with a rounded lower part and the recess 11 of the fastener 2 with a circular cross section allow the fastener 2 to rotate around its common axis in the locked position. Because of this construction, the telephone can be rotated around the axis of the fastener forward or backward, for example when sitting down.

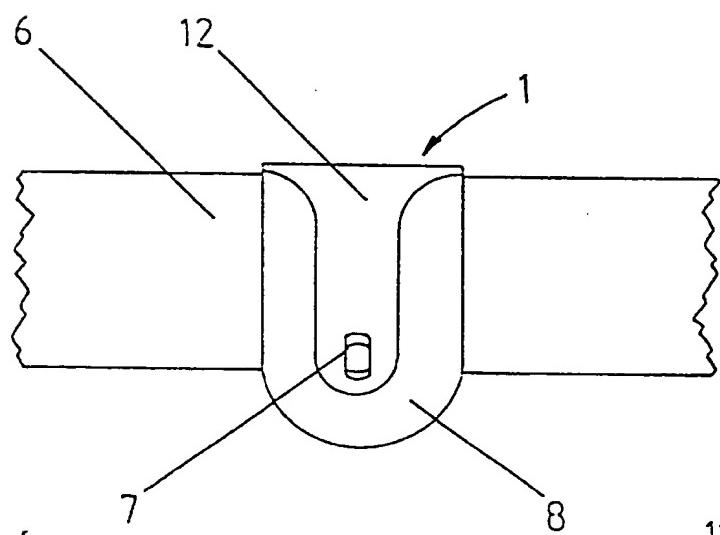
**Claims**

1. A device for removably attaching a mobile station to a garment, comprising;
  - a first part adapted to be attached to a mobile station; and
  - a second part adapted to be attached to a garment,
 wherein the second part further comprises means for slidably receiving and locking the first part such that in the locked condition, relative rotation between the first and second parts is permitted.
2. An attachment device to be used with a mobile station which can be removed from the attachment device and reinstalled to it, wherein the attachment device comprises a body (1) attached e.g. to a belt with an attachment plate (5) and a fastener (2) attached to a mobile station with a fitting piece (3), said body (1) including guide flanges (8) bent inward from two opposite sides and from below to guide the fastener (2) which includes a neck (10) and a wider end comprising a flange (9) which goes behind the guide flanges (8), and said body (1) including a projection (7) or a similar structure acting against a spring force which, when the fastener (2) is in the locked position, resists the upward movement of the fastener (2).
3. An attachment device as claimed in claim 2, wherein the body (1) comprises a flat part with a rounded lower end and near it a locking cone (7) with rounded edges acting against a spring force, and a guide flange (8) formed of an edge bent inward circling the sides and the rounded lower end of the flat part (12) of the body (1), which guides the fastener (2) over the locking cone (7), said fastener (2) comprising a neck (10) with a circular outer perimeter and a flange (9) with a preferably circular outer perimeter, containing an axial hollow (11) with a circular cross section; and, in the locked position, the flange (9) of the fastener (2) goes into the space between the flat part (12) of the body (1) and the guide flange (8), and the locking cone (7) goes into the hollow (11) of the fastener (2), the diameter of said hollow (11) corresponding to the diameter of the locking cone (7) at least in the longitudinal direction of the body (1).
4. An attachment device as claimed in claims 2 or 3, wherein the attachment plate (5) comprises a plate bent in the form of U, attached at the point of the bend in the U to the upper end of the flat part (12) of the body (1).

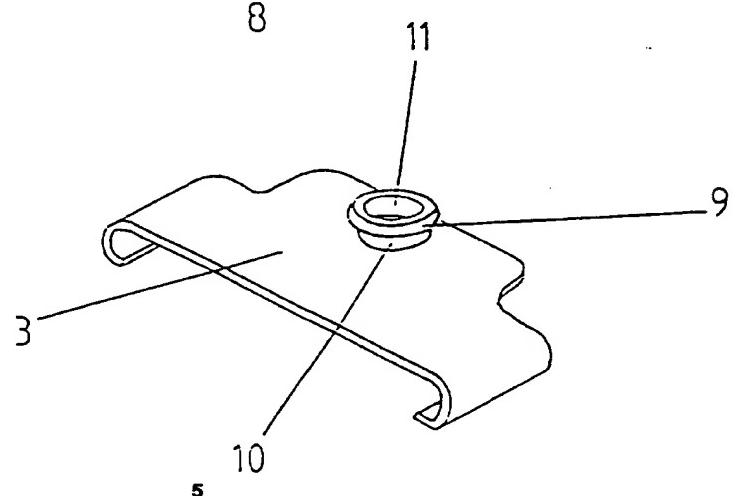
5. An attachment device as claimed in claim 4, wherein the lower end of the U-branch of the attachment plate (5) placed under a belt is free.
6. An attachment device as claimed in claim 5, wherein the lower end of the U-branch of the attachment plate (5) placed behind a belt includes a locking system to attach the free lower end of the attachment plate (5) to the lower part of the body (1).
7. An attachment device as claimed in any of claims 2 to 6, wherein the other U-branch of the attachment plate (5) placed over a belt serves as a spring against which the locking cone (7) acts.
8. An attachment device as claimed in claims 2 or 3, wherein the distance between the guide flange (8) and the flat part (12) of the body essentially corresponds to the thickness of the flange (9) of the fastener (2).
9. An attachment device as claimed in claims 2 or 3, wherein the length of the neck (10) of the fastener (2) is a little greater than the thickness of the guide flange (8) circling the flat part (12) of the body.
10. An attachment device as claimed in claim 2, wherein the fitting piece (3) comprises a plate installed on the casing of the mobile station, near to its end, essentially transversely to the longitudinal axis of the mobile station, and bent at both ends over the casing of the mobile station, extending to its sides or to the opposite side in correspondence with the shape of the mobile station.
11. An attachment device as claimed in claim 10, wherein the farthest ends of the fitting piece (3) are bent in such a manner that they grip the groove in the casing of the mobile station and act as springs pressing the fitting piece (3) against the casing of the mobile station.
12. A device as claimed in any of the preceding claims wherein the mobile station is a telephone or a paging device.



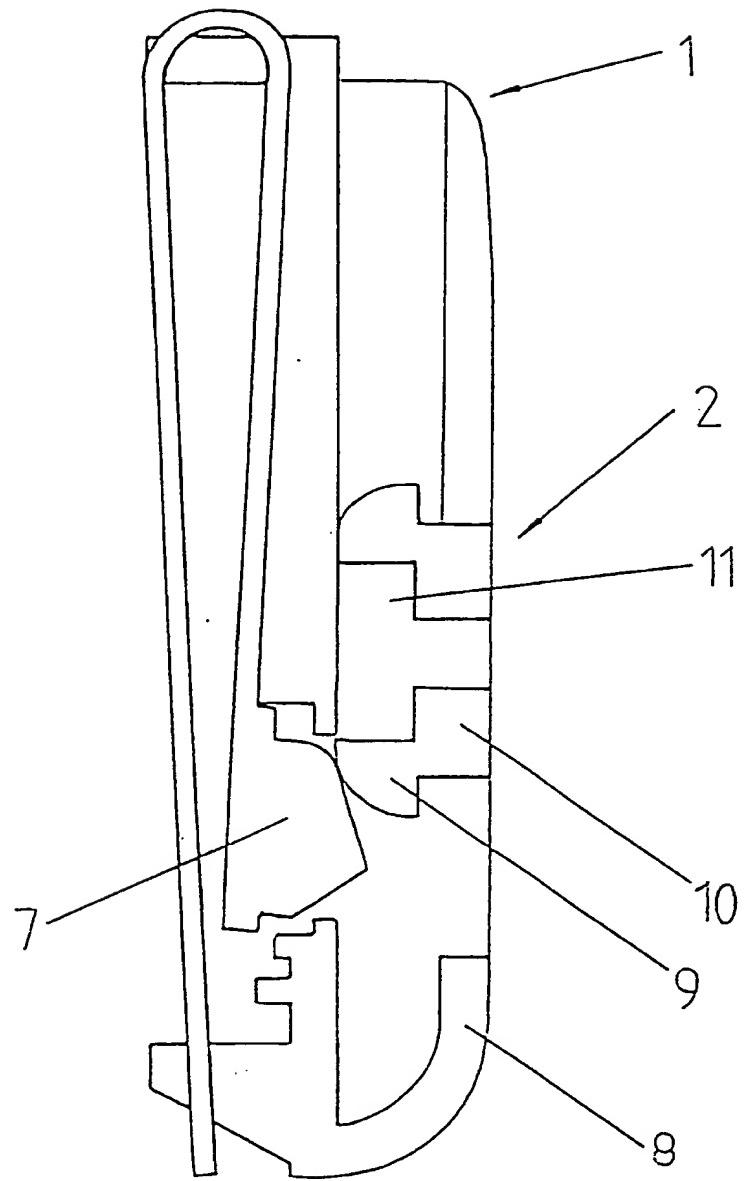
**FIG. 1**



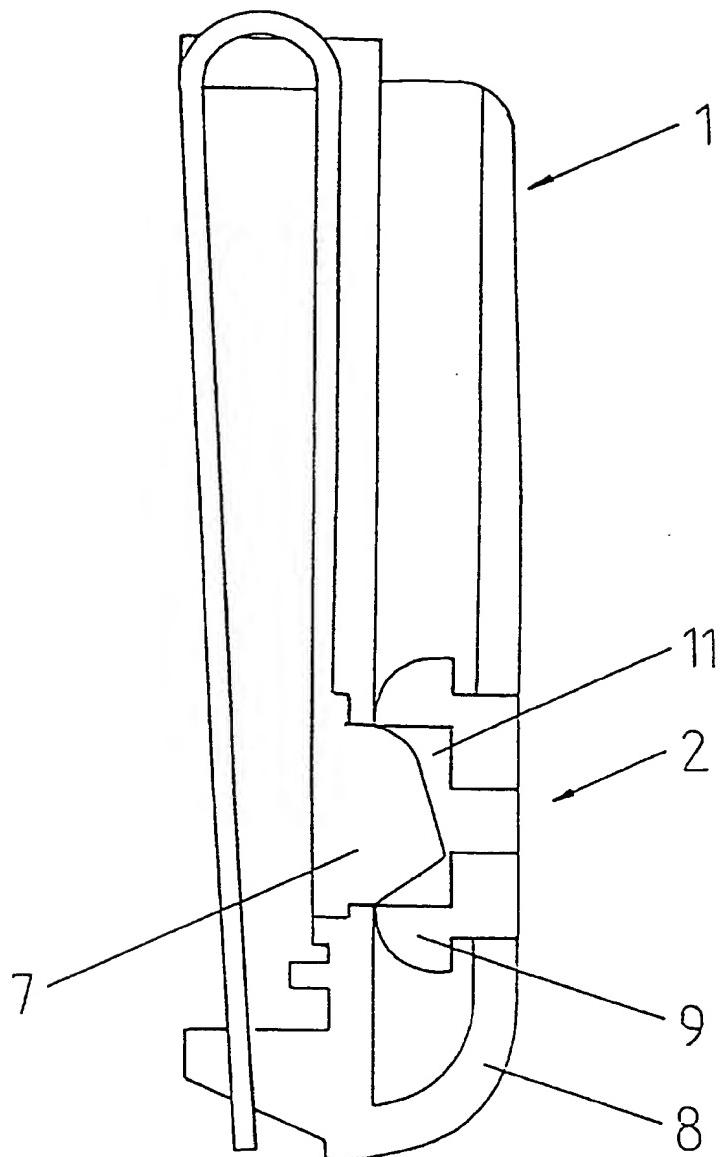
**FIG. 2**



**FIG. 3**



**FIG. 4**



**FIG. 5**



DOCUMENTS CONSIDERED TO BE RELEVANT			EP 95303320 6 CLASSIFICATION OF THE APPLICATION (Int. Cl. 6)						
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim							
A	<u>US - A - 3 878 589</u> (SCHAEFER) * Abstract; column 1, lines 5-47; fig. 1; claim 1 *	1-3, 12	H 04 M 1/00						
A	<u>US - A - 4 479 596</u> (SWANSON) * Abstract; column 1, line 5 - column 2, line 69; fig. 1,3,5; claim 1 *	1-3, 12							
A	<u>US - A - 5 016 326</u> (GOLDENBERG) * Abstract; column 1, line 4 - column 2, line 6; fig. 1-4; claim 1 *	1-3, 12							
			TECHNICAL FIELDS SEARCHED (Int. Cl. 6)						
			H 04 M A 44 B A 45 C A 45 F						
<p>The present search report has been drawn up for all claims</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%;">Place of search</td> <td style="width: 33%;">Date of completion of the search</td> <td style="width: 34%;">Examiner</td> </tr> <tr> <td>VIENNA</td> <td>25-08-1995</td> <td>BADICS</td> </tr> </table>				Place of search	Date of completion of the search	Examiner	VIENNA	25-08-1995	BADICS
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